

## STATEMENT

By Arthur S. Flemming, Secretary of Health,  
Education, and Welfare, April 28, 1960

# Strontium 90 Content of Wheat

The regular quarterly statement on fallout of the Atomic Energy Commission, released April 28, 1960, contains data relating to the strontium 90 content of wheat and wheat products from the 1958 crop in Minnesota, North Dakota, Montana, Illinois, Kansas, Oklahoma, Texas, Michigan, and New York. These data are summarized below:

Material	Strontium 90 ( $\mu\text{mc./kg.}$ )		
	Low	High	Average
Wheat .....	21	133	62
Patent flour.....	3	42	12
1 and 2 clear flour.....	6	86	28
Germ .....	50	191	
Shorts .....	28	665	
Bran .....	52	675	231

NOTE: A curie is a measure of radioactivity equivalent to that produced by 1 gram of radium. A microcurie ( $\mu\text{c.}$ ) is 1 millionth of a millionth of a curie.

The statement of the Atomic Energy Commission also shows that up to the present time analyses on the 1959 crop have been completed for whole wheat only. These analyses show results similar to those for the 1958 crop.

At my request, the Public Health Service, the Food and Drug Administration, and the Federal Radiation Council have reviewed these data. They have advised me that the strontium 90 intake of the U.S. population from all dietary sources does not constitute a public health hazard warranting any regulatory action at the present time.

The conclusion that the present situation does not call for any regulatory action was based on the following considerations:

The guideline for average daily intake of strontium 90 used by this Department at present is 33 micromicrocuries per liter or kilogram of total dietary intake averaged over a period of

1 year. This value is derived from the recent interim recommendation of the National Committee on Radiation Protection and Measurements that the values suggested by the International Commission on Radiation Protection for planning purposes be accepted. Although this guideline was not developed to serve as a limit for regulatory purposes, it is a conservative basis for evaluating the significance of these data. For general populations the International Commission on Radiation Protection suggested 33 micromicrocuries per liter or kilogram based upon a 50-year exposure, but for operating purposes averaged over periods not to exceed 1 year. This value applies to all groups within the population. In considering the health effects of strontium 90 it is necessary to take into account the amounts ingested from all sources. The average weight of food and water ingested per day per individual in the United States is 2.2 kilograms. If all food and water contained this concentration of 33 micromicrocuries per kilogram the daily intake of strontium 90 would be 73 micromicrocuries ( $2.2 \times 33$ ).

The following diet shows how the wheat data reported by the Atomic Energy Commission would be reflected in a typical adult diet of 2,200 grams per day. (A gram is  $\frac{1}{1,000}$  of a kilogram or  $\frac{1}{28.35}$  of an ounce.) This diet is adapted from one that was presented by the Public Health Service at hearings of the Joint Committee on Atomic Energy last year. An estimated average daily consumption of 1.8 grams of bran, as estimated by the U.S. Department of Agriculture, was added to this diet (rounded in the table to 2.0 grams). The strontium 90 values for bran and flour products in this diet are the average values of the Atomic

Energy Commission report. The strontium 90 values for other items of this diet are considered typical for a large metropolitan area.

Diet item	Strontium 90 content in micro-microcuries per gram	Food consumption in grams per day	Strontium 90 in micro-microcuries per day
Bran	0.231	2	0.4
Flour products	.012	227	2.7
Foods other than milk, water, and wheat products	.004	971	3.9
Milk and milk products	.010	410	4.1
Water and other non-milk fluids	.001	590	1.0
Total		2,200	12.1

The averages were used in the above table because the National Committee on Radiation Protection and the International Commission on Radiation Protection recommendations are for general population averages. It is, however, necessary to consider individual variations from the average involving the known deviations in concentrations of strontium 90 from the average and individual variations in dietary habits. In calculating the guidelines for specific averages, the National Committee on Radiation Protection and the International Commission on Radiation Protection recommendations allow departures as much as three times such averages. In a given case this could be equivalent to an individual lifetime average of 220 micromicrocuries of strontium 90 per day.

I have had my staff calculate the strontium 90 content of various probable diets under the varying concentrations of strontium 90 reported by the Atomic Energy Commission. The conclusion was that it would be highly improbable that any individual could attain an average of 73 micromicrocuries of strontium 90 per day for life, let alone the higher figure of 220 micromicrocuries.

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Available evidence indicates that in 1958 the major fraction of strontium 90 found in wheat was directly absorbed through the outer layer of the kernel, this coming from atmospheric deposition. Some is absorbed through other parts of the plant. The relative contribution of strontium 90 from various parts of the plant is dependent upon the existing conditions, such as atmospheric deposition, accumulation in the soil, and the weather. Studies reveal, however, that of the amount of strontium 90 absorbed by the leaves of the plant only very little is transported to other parts of the plant.

The strontium 90 in bran used for livestock feed is not posing a problem at this time. The total diet of livestock includes bonemeal and inorganic minerals as the principal sources of calcium. Research with the dairy animal has established the fact that milk contains about one-tenth of the amount of strontium 90 that is consumed in the feed. Since strontium 90 is deposited in the bones, it does not provide a problem in the meat of the beef animal.

### Arthur P. Miller Retires

Arthur P. Miller, a sanitary engineer with the Public Health Service for nearly 40 years, retired on May 31.

During most of his career, Mr. Miller was stationed at headquarters in Washington, D.C., with responsibilities for water, vessel, and shellfish sanitation investigations, and surveys of sanitary engineering education.

Mr. Miller is author or co-author of about 100 publications in the engineering field. He is a member of the American Public Health Association and has served on its governing council and its editorial board. He has served as chairman of the publications committee of the Federation of Sewage Works Federations and as acting executive editor of *Public Health Reports*.

# Federal Publications

**First Things and Last. The story of birth and death certificates.** *PHS Publication No. 724; 1960; 24 pages; 15 cents.*

A pamphlet that tells what birth and death certificates are used for; who fills them out; and the route they travel from hospital, physician, and funeral director to the health department and permanent filing.

It is designed to inform persons who are involved in registration of birth and death certificates but who are not a direct part of the system.

**Cerebral Palsy. Hope through research.** *PHS Publication No. 713 (Health Information Series No. 95); 1960; leaflet; 5 cents, \$3 per 100.* Explains some known causes and discusses possible prevention of cerebral palsy. Describes main types and extent of condition, mentions common handicaps, and reviews helpful treatment. Gives sources of medical aid and stresses importance of research.

**Highlights of Progress in Research on Neurological and Sensory Disorders, 1959.** *PHS Publication No. 741; 1960; 60 pages; 25 cents.*

Items of interest on program developments and research studies conducted and supported during 1959 by the National Institute of Neurological Diseases and Blindness are presented. Subject areas include: nerve regeneration, the central nervous system, brain and cerebral cortex, infant abnormalities, neuromuscular disorders, parkinsonism, multiple sclerosis, amyotrophic lateral sclerosis, encephalitis, epilepsy, mental retardation, cerebral palsy, cerebrovascular diseases, and visual and hearing disorders.

Grants and training programs of several kinds are discussed as well as such collaborative projects as a 5-year study for early detection of glaucoma and the study on wastage in human pregnancy. In general, the institute's national and international attack on neurological and sensory disorders is outlined.

**National Institutes of Health.** *PHS Publication No. 81; revised 1960; 28 pages; 25 cents.*

This brochure is designed to give an overview of participation and support of the Nation's medical research program by the Federal Government through the National Institutes of Health, Public Health Service.

Pictures and text describe the organization and functions of the seven institutes and four divisions that make up the agency. Research studies are also discussed.

A brief history of NIH is included as well as a statement of present emphasis and philosophy.

**An Occupational Health Program for Hospital Employees.** *PHS Publication No. 725; 1959; 11 pages.*

Designed to help the hospital administrator resolve some practical problems relating to occupational health programs for hospital employees, this booklet attempts to answer questions concerning personnel, facilities and equipment, records, and costs.

Special sections are devoted to administrative relationships, services provided, and a list of references.

**Diabetes Program Guide.** *PHS Publication No. 506; revised 1960; 68 pages; 50 cents.*

Originally published in 1956, this guide has been used extensively by doctors, nurses, technicians, and administrators responsible for diabetes control in States and communities. It covers such topics as physiology of the disease; types of screening projects for diabetes detection; diagnostic standards, tests, and laboratory procedures; professional and community education; and other pertinent information.

Final results of the diabetes test validation studies replace preliminary data included in the first edition of the publication. Other text changes reflect newer thinking in diabetes management and detection.

**Immunization Information for International Travel.** *PHS Publication No. 384; revised 1960; 67 pages; 25 cents, \$18.75 per 100.*

Directed primarily to travelers going abroad, health departments, and physicians, this booklet gives current details on immunization requirements for persons entering the United States, including Americans returning from abroad, and lists requirements and recommendations for immunization in 200 other countries. A list of yellow fever vaccination centers and a special section on bringing pets into the United States is also included.

This edition supersedes the 1959 revision.

**Local Health Organization and Staffing Within Metropolitan Areas.** *PHS Publication No. 742; 1960; 184 pages; \$1.*

Data presented State by State show the organization and staffing of local health departments serving within the 189 standard metropolitan areas as defined September 1959 by the Bureau of the Budget.

In addition, the legal basis existing within each State under which jurisdictions may combine to provide local public health services is described. The data were compiled from reports made to the Public Health Service for specified periods in 1958 and fiscal year 1957.

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This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

Unless otherwise indicated, publications for which prices are quoted are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Office of Information, Public Health Service, Washington 25, D.C.

The Public Health Service does not supply publications other than its own.

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